

Notice of Allowability

Application No.

10/797,286

Applicant(s)

MURUGESH ET AL.

Examiner

RAKESH K. DHINGRA

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Supplemental Amendment dt. 5/21/08.
2. ☒ The allowed claim(s) is/are 1, 3-5, 7-13 and 15-19.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>5/22/08</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other ____. |

/Rakesh K Dhingra/
Examiner, Art Unit 1792

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ashok K. Janah on 5/22/08.

The application has been amended as follows:

In the claims:

1. (Currently amended) A self-cleaning gas distributor capable of distributing a gas across surfaces in a substrate processing chamber, the gas distributor comprising:
 - (a) a hub comprising a gas inlet to receive a gas and a gas outlet comprising first and second terminus to expel the received gas;
 - (b) a baffle extending radially outward from the hub, the baffle having opposing first and second surfaces and comprising an outer perimeter;
 - (c) a plurality of spaced apart first vanes on the first surface of the baffle, the plurality of first vanes extending upwards from the first surface and configured to direct the gas expelled from the first terminus across a chamber surface, each first vane comprising an arcuate plate that curves outward from the hub to the outer perimeter of the baffle; and
 - (d) a plurality of second vanes on the second surface of the baffle, the plurality of second vanes comprising a plurality of ~~inclined~~ surfaces that are inclined to the second surface of the baffle and wherein pairs of inclined surfaces are configured to direct the gas expelled from the second terminus across a sector of the second surface of the baffle to clean the gas distributor.

4. (Currently amended) A gas distributor according to claim 1 wherein the hub

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comprises first and second channels, and wherein the first terminus of the gas outlet ~~comprises~~ pertains to the terminus of the first channels, and the second terminus of the gas outlet ~~comprises~~ pertains to the terminus of the second channels.

8. (Currently amended) A gas distributor according to claim 1 wherein the second vanes comprise ~~inclined~~ surfaces that are inclined to the second surface of the baffle at an angle of about 5 degrees to about 60 degrees.

9. (~~Currently amended~~ Previously Presented) A gas distributor according to claim 1 wherein the hub comprises a gas feed-through tube capable of allowing a gas to bypass the first and second vanes and enter the chamber.

11. (Currently amended) A self-cleaning gas distributor to distribute a gas from an external source across surfaces in a substrate processing chamber having a wall with a cavity, the gas distributor comprising:

- (a) a hub that fits into the cavity in the wall of the chamber, the hub comprising (i) a plurality of first channels on an external surface of the hub that mates with the cavity, each first channel comprising an opening and a first terminus, the opening capable of receiving the gas from the external source; (ii) a plurality of second channels, each second channel capable of receiving the gas from the first terminus of the first channels and expelling the gas from a second terminus; and (iii) a gas feed- through tube;
- (b) a baffle plate extending radially outward from the hub, the baffle plate comprising first and second surfaces, an outer perimeter, and an aperture capable of allowing passage of the gas along the second channels;
- (c) a plurality of spaced apart first vanes on the first surface of the baffle plate, the plurality of first vanes extending upwards from the first surface and configured to direct the gas expelled from the first terminus

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across the surfaces of the chamber, each first vane comprising an arcuate plate that curves outward from the hub;

(d) a plurality of second vanes on the second surface of the baffle plate, the plurality of second vanes configured to direct the gas expelled from the second terminus across the second surface of the baffle plate each second vane comprising a ~~an inclined~~ surface that is inclined to the second surface of the baffle plate and wherein adjacent pairs of inclined surfaces are configured to direct the gas across a sector of the second surface of the baffle plate to clean the gas distributor;

wherein the gas feed-through tube allows the gas to bypass the first and second set of vanes.

15. (Currently amended) A substrate processing apparatus comprising:

(a) a remote chamber to activate a gas;

(b) a process chamber comprising chamber walls, interior

chamber surfaces, a substrate support, a self-cleaning gas distributor, and a gas exhaust, the gas distributor being capable of receiving the d gas from the remote chamber and distributing the gas into the process chamber, along the chamber walls and interior chamber surfaces, and about the gas distributor, the gas distributor comprising:

(i) a hub comprising a gas inlet to receive the gas, a gas outlet comprising first and second terminus to expel the received gas, and a gas feed- through tube;

(ii) a baffle extending radially outward from the hub, the baffle having opposing first and second surfaces and comprising an outer perimeter;

(iii) a plurality of spaced apart first vanes on the first surface of the baffle, the plurality of first vanes extending upwards from the first surface and configured to direct the gas expelled from the first terminus across the enclosing walls and interior chamber surfaces, each first vane comprising an arcuate plate that curves outward from the hub to the outer perimeter of the baffle; and

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(iv) a plurality of second vanes on the second surface of the baffle, the second vanes each comprising ~~an~~ inclined a surface that is inclined to the second surface of the baffle and wherein adjacent pairs of inclined surfaces are configured to direct the gas expelled from the second terminus across a sector of the second surface of the baffle to clean the gas distributor;

wherein the gas feed-through tube allows a gas to bypass the first and second vanes.

Allowable Subject Matter

Claims 1, 3-5, 7-13, 15-19 allowed.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

Claim 1: Closest prior arts [(Muruges et al – US 6,450,117), and Halsey et al (US 6,663,025)] do not teach claim limitation “a plurality of spaced apart first vanes on the first surface of the baffle, the plurality of first vanes extending upwards from the first surface and configured to direct the gas expelled from the first terminus across a chamber surface, each first vane comprising an arcuate plate that curves outward from the hub to the outer perimeter of the baffle; and

(d) a plurality of second vanes on the second surface of the baffle, the plurality of second vanes comprising a plurality of surfaces that are inclined to the second surface of the baffle and wherein pairs of inclined surfaces are configured to direct the gas expelled from the second terminus across a sector of the second surface of the baffle to clean the gas distributor” in the context of remaining limitations of the claim.

Claim 11: Closest prior arts [(Muruges et al – US 6,450,117), and Halsey et al (US 6,663,025)] do not teach claim limitation “a plurality of spaced apart first vanes on the first surface of the baffle plate, the plurality of first vanes extending upwards from the first surface and configured to direct the gas

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expelled from the first terminus across the surfaces of the chamber, each first vane comprising an arcuate plate that curves outward from the hub;

(d) a plurality of second vanes on the second surface of the baffle plate, the plurality of second vanes configured to direct the gas expelled from the second terminus across the second surface of the baffle plate each second vane comprising a surface that is inclined to the second surface of the baffle plate and wherein adjacent pairs of inclined surfaces are configured to direct the gas across a sector of the second surface of the baffle plate to clean the gas distributor” in the context of remaining limitations of the claim.

Claim 15: Closest prior arts [(Murugesh et al – US 6,450,117), and Halsey et al (US 6,663,025)] do not teach claim limitation “a plurality of spaced apart first vanes on the first surface of the baffle, the plurality of first vanes extending upwards from the first surface and configured to direct the gas expelled from the first terminus across the enclosing walls and interior chamber surfaces, each first vane comprising an arcuate plate that curves outward from the hub to the outer perimeter of the baffle; and (iv) a plurality of second vanes on the second surface of the baffle, the second vanes each comprising a surface that is inclined to the second surface of the baffle and wherein adjacent pairs of inclined surfaces are configured to direct the gas expelled from the second terminus across a sector of the second surface of the baffle to clean the gas distributor” in the context of remaining limitations of the claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RAKESH K. DHINGRA whose telephone number is (571)272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rakesh K Dhingra/
Examiner, Art Unit 1792

/Parviz Hassanzadeh/
Supervisory Patent Examiner, Art Unit 1792